

Genetic Identification of Planktotrophic Gastropod Veligers from Hawai'i Surface Slicks

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What are surface slicks?

- Surface slicks are patches of smooth surface water that act as **biodiversity hotspots**
- Provide **nursery habitat** for marine larvae including fish and invertebrates

Discussion

- 6 species of planktotrophic larvae were identified, each represents a Hawai'i **intertidal marine gastropod**
- Well-supported **sister clades** of *Drupa ricinus* samples represent **two distinct populations** (~2% molecular divergence)
- Morphology of Beach Janthina samples suggest it is *J. janthina*, a species **lacking representative COI sequences** in GenBank
- COI data for **species 9** not currently providing a strong GenBank match, **warrants additional sampling**
- Assessment of shell characters was used with COI sequences because different biological species can, though rare, share **haplotypes**

Conservation Significance

- Intertidal snails such as **nerites** (Pipipi), **periwinkles** (Pūpū Kōlea) (found in this study), & endemic **limpets** (Ophi) are culturally important **food sources** in the Hawaiian Islands
- Understanding **patterns of offshore drift** of veligers adds to our understanding of the dynamics of dispersal & intertidal recruitment, crucial information for **natural resource management strategy**

Methods

1. Sample Collection:



Snails sorted from trawl samples that targeted surface slicks

2. DNA Extractions:



Extractions performed on individual morphologically distinct snails

3. Polymerase Chain Reaction:



Using Polymer (1994) primers to amplify the cytochrome c oxidase I (COI) gene fragment

4. Agarose Mini-Gel Electrophoresis:



To visualize successful amplification

5. Sanger Sequencing:



652 base pair fragments were produced at the ASGP Center at the University of Hawaii, Manoa

6. Phylogenetic & Taxonomic Analysis:



Trees were generated using MEGA 11 (see Fig.1). GenBank matches determined via reciprocal monophyly and NCBI Blastn searches

7. Protoconch Analysis:



Photomicrographs recorded for morphology analysis

Results

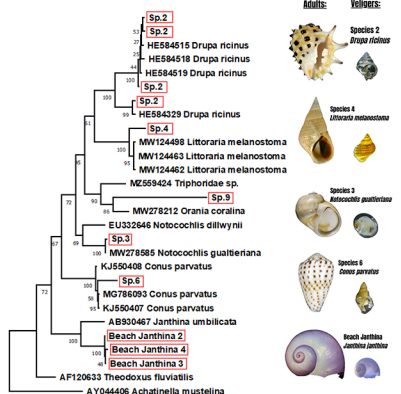


Figure 1. Phylogenetic Analysis. Tree was generated using Maximum-Likelihood and Hasegawa-Kishino-Yano model with 1000 bootstrap replicates. Operational taxonomic units w/ red boxes are surface slick larval snails: Sp. 2,3,4, and 6, and snails collected on Oahu's windward side, Beach Janthina 2,3, and 4. Additional sequence were from NCBI GenBank. Images depict surface slick protoconch veliger shells (right column) and adult shells of closest GenBank matches (left column).

• Genus level identifications:

- Littoraria - Sp.4
- Janthina - Beach Janthina 2, 3, and 4
- Conus - Sp.6

• Species level identifications:

- *Drupa ricinus* - Sp.2
- *Notocochlis gualtieriana* - Sp.3
- Sequence for Sp.9 does not show a close match to any GenBank sequence



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